The Beach Environmental Assessment, Communication, and Health (BEACH) Program: Results and Trends from 2004

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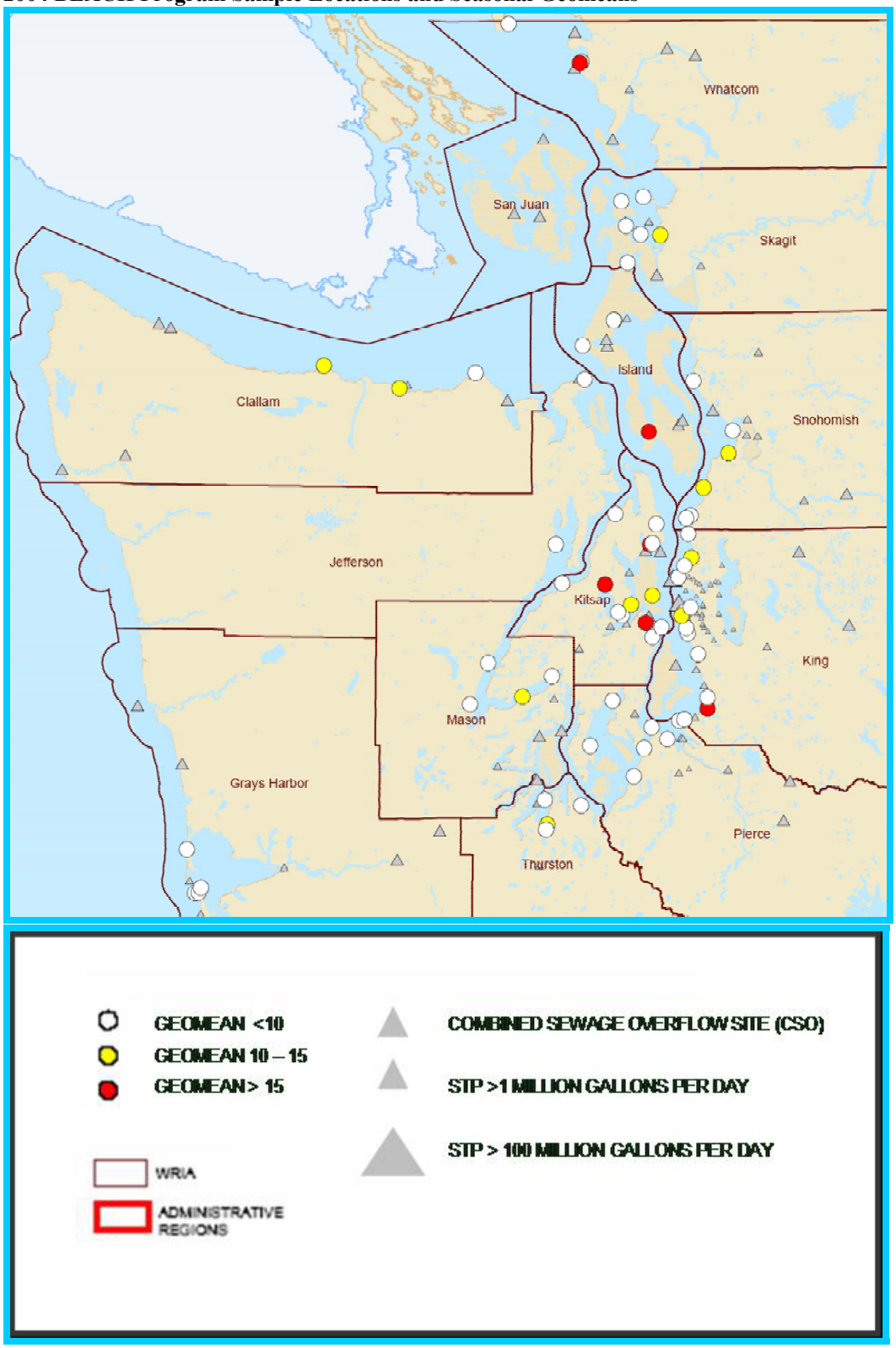
Introduction

The Beach Environmental Assessment, Communication, and Health Program (BEACH) is currently being implemented in Washington State in response to the BEACH Act which was passed by the US Congress in 2000 to create a uniform system to reduce the risk of disease to users of the State of Washington's marine waters. The Washington Department of Ecology (Ecology) is funded through the US EPA and works jointly with the Washington Department of Health (Health), county environmental health departments, and a multi-agency BEACH Advisory committee to implement the BEACH Program for Washington State. The BEACH Program monitors popular marine recreational beaches that have been identified as having a potential fecal pollution source and notifies the public of the results.In 2004, the BEACH Program implemented the first full year of state-wide monitoring for bacteria in Washington's marine recreational waters. County environmental health departments, Ecology, Health, park managers and volunteers combined to sample 72 beaches located in 12 coastal counties during the summer of 2004. The total number of excursions to marine beaches to sample the water was well over 1,060. Three samples were taken across each beach and a total of 3,408 sample results were submitted to EPA.

Methods

Bacteria levels were monitored at 72 marine recreational beaches. Beaches were sampled once a week from the end of May through September 15, 2004. Beaches were resampled when the results were above EPA's single sample maximum of 104 enterococcus colonies per 100 mL. Samplers wore rubber gloves, waded into a depth of 18 inches and used a sample wand to collect samples from the top water layer at a water depth of 24 inches. Samples were immediately placed on ice and delivered to a State of Washington accredited laboratory within 6 hours of sample collection (Samples taken from Cape Disappointment State Park were delivered within 24 hours of sample collection due to transportation limitations). Pierce County used the LTB EC-MUG 9221B method to determine samples. All other laboratories used Enterolert® to determine the most probable number of enterococcus colonies.

2004 BEACH Program Sample Locations and Seasonal Geomeans



Results

Seasonal geometric means for all 72 beaches were below EPA's marine water criteria recommendations for water contact activities of 35 enterococcus colonies per 100 milliliters. As a general trend, the State of Washington has very clean marine beaches. 74% of the beaches had geometric means representing background levels. The lower detection limit for marine water using Enterolert® is 10 enterococcus colonies/100 mL. To represent the possible numeric variation when samples results were less than 10, random numbers between 1 and 9 were assigned for the geometric mean calculations. Slightly increased levels of bacteria occurred in 18% of the beaches. Increased levels of bacteria at beaches with a geometric mean greater than 15 colonies enterococcus per 100 mL were considered to be beaches of concern, this occured in 8% of the beaches.

Beach Advisories and Closures

Table 1. 2004 WA State BEACH Program Advisories and Closures

Beach name	Date of Advisory	Advisory or Closure	Decision based on:
Lions Park	May 24, 2004	Closure	Sewer spill
Evergreen Park	May 24, 2004	Closure	Sewer spill
Illahee State Park	May 24, 2004	Closure	Sewer spill
Silverdale County Park	May 24, 2004	Closure	Sewer spill
Howarth Park	September 1, 2004	Advisory	Sample results
Picnic Point County Park	September 1, 2004	Advisory	Sample results
Priest Point Park	July 1, 2004	Advisory	Sample results
Twanoh State Park	June 24, 2004	Advisory	Sample results
Carkeek Park	August 23, 2004	Advisory	Sample results
Lowman Beach	August 23, 2004	Advisory	Sample results

Discussion

In 2004, the seasonal geometric means for enterococcus bacteria at all of the marine recreational beaches sampled by Washington State's BEACH Program were below EPA's recommended criteria of 35 cfu/100 mL. However, there were single sample events that showed an increased level of bacteria above the 104 enterococcus colonies per 100 mL threshold. Six public health advisories were posted based on sample results. These advisories state, "A health advisory has been posted based on monitoring results. The current conditions at this beach are not suitable for recreational water activities. Small children and chronically ill people are at higher risk for increased illness."The beaches with increased levels of bacteria were typically within close proximity to urban communities and often had a freshwater or stormwater flow onto the beach. Another general trend for beaches with increased bacteria levels was the type of sediment. Beaches with fine sediments tended to have increased levels of bacteria more often. Many of the increases in bacteria levels showed up during windy days, suggesting a potential for bacteria to grow in the sediment and resuspend when disturbed by waves driven by the wind or when the sediment is stirred up by people. Clearly, people living near the shore impact bacteria levels at the beaches. With the population in the Puget Sound region expected to grow by 1.2 nearly one million people by 2025, bacteria levels at recreational beaches are likely to continue to increase.

Links

BEACH Program: http://www.doh.wa.gov/beach/
2004 BEACH Program Data: http://www.ecy.wa.gov/programs/eap/beach/data.html

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